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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/821,100

04/07/2004

Zhong Dong

M-15295 US

8965

7590

06/27/2005

EXAMINER

VU, DAVID

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ART UNIT

PAPER NUMBER

2818

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

5m

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/821,100	DONG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	DAVID VU	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06/06/05.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### **Election/ Restriction**

1. Applicant's election of Group II (Claims 1-15) filed on 06/01/05 is acknowledged. The traverse is on the ground(s) that "the language of claim 16 clearly requires a dry ISSG process". This is not found persuasive because the patentability of a product by process claim is determined by the final product, regardless of how actually made, In re Hirao 190 USPQ 15 at 17 (footnote 3).

The requirement is still deemed proper and is therefore made FINAL.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4, 8, 13 and 14 are rejected under 35 U. S. C. 102(e) as being anticipated by Fujimoto et al. (US Pat. 6,830,973, herein after Fujimoto).

Regarding claims 1-4 and 8, Fujimoto discloses a process of forming sidewall dielectric on an memory cell stack where at least one sidewall of the memory cell stack includes a plurality

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of exposed material layers 13/14B respectively composed of different materials, the method comprising: subjecting the at least one sidewall to a dry ISSG process (In-Situ Steam Generation) where the dry ISSG process comprises: flowing molecular oxygen and molecular hydrogen towards the stack; where the volumetric flow ratio of the  $H_2:O_2$  is less than about 0.2 (0.5%  $H_2$  : 99.5  $O_2$ %) at a temperature of about 900-1100°C and a pressure of about 100Pa - 2000Pa (7.5-15Torr) (See Abstract and fig. 1).

Regarding claims 13 and 14, Fujimoto discloses a larger erase speed is obtained in a memory cell after formation of the sidewall dielectric by the dry ISSG process (col. 7, lines 32-38).

3. The Examiner has not given patentable weight to the preamble limitation of "an ONO-type memory cell stack where at least one sidewall of the ONO-type memory cell stack includes a plurality of exposed material layers respectively composed of different materials " because "[A] claim preamble has the import that the claim as a whole suggests for it". *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give, life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). As the body of the claim makes no reference, nor allusion, to the ONO-type memory cell stack (i.e. - the preamble does not recite limitations of the claim), and since the above referenced preamble limitation does not give life or meaning to the claim, it is deemed to be of no patentable weight. See MPEP § 2111.02.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 4, 8-11 and 15 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kim et al. (US Pat. 6,806,517, herein after Kim) in view of Gluschenkov et al. (US Pat. 6,667,197, herein after Gluschenkov).

Kim discloses in figs. 5-10B a method of forming sidewall dielectric on an ONO-type memory cell stack where at least one sidewall of the ONO-type memory cell stack includes a plurality of exposed material layers respectively composed of different materials, the method comprising subjecting the sidewall to a CVD oxide process to form a sidewall oxide 632 (fig. 5) and forming an supplemental sidewall dielectric 634 (SiN) after the CVD oxide process.

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Kim fails to disclose forming the sidewall oxide layer by a dry ISSG process. However, Gluschenkov teaches in col. 5, line 63 through col. 6, line 8 that the sidewall oxide layer is formed by a dry ISSG process at a temperature is about 850 to 900.degree. C., the pressure is about 10 Torr, the amount of hydrogen is about 10% by number density (therefore the volumetric flow ratio of the H<sub>2</sub>:O<sub>2</sub> is less than about 0.2 (10% H<sub>2</sub>: 90% O<sub>2</sub>), and the processing time is less than about 10 seconds. It would have been obvious to one with ordinary skill in the art at the time of the invention to form an oxide film by using a dry ISSG process as taught by Gluschenkov in the process of Kim. As recognized by one skilled in the art, a dry ISSG process provides excellent thickness control and excellent thickness uniformity.

5. Claims 3, 5-7 and 12 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kim et al. (US Pat. 6,806,517, herein after Kim) in view of Gluschenkov et al. (US Pat. 6,667,197, herein after Gluschenkov).

Kim and Gluschenkov fails to disclose the volumetric flow ratio of H<sub>2</sub>/O<sub>2</sub> is equal to, or less than, about 0.02 (claim 3); the ISSG process is about 20 seconds to about 300 seconds (claim 5); the O<sub>2</sub> flow rate is about 3slm to about 10slm (claim 6); the H<sub>2</sub> flow rate is about 0.1slm to about 1slm (claim 7); and a height variation ratio is about 1.20 or less (claim 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined process of Kim and Gluschenkov process by selecting a suitable time, flow rate and thickness in order to achieve a specific sidewall dielectric, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Moreover, the specification contains no disclosure of either the critical

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nature of the claimed process/device (i.e. - time, flow rate and thickness) or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon another variable recited in a claim, the Applicant must show that the chosen limitation are critical. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).

### Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

June 24, 2005.